

Conceptualizing Restoration of Nearshore Ecosystem Processes

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The Puget Sound Nearshore Ecosystem Restoration Program (PSNERP) Nearshore Science Team (NST) has developed a conceptual model to aid in planning and guiding the scientific elements of the restoration program. Our goal is to describe the state of knowledge about complex relationships linking the structure, processes and functions of Puget Sound nearshore ecosystems. The approach is based on the premise that restoring just the structure of the system without reconstituting the underlying ecosystem processes is scientifically unsound. Thus, emphasis is on processes (“how it works”), rather than structure (“how it looks”) of nearshore ecosystems per se, and how processes and structure influence ecosystem functions. The model incorporates: (1) nested architecture; (2) spatial and temporal scales; (3) landscape context; (4) explanation and prediction of change; (5) pathways to assess consequences of ecosystem restoration; and (6) transferability to a computational model. These criteria suggested a model with five hierarchical levels: (1) spatial and landscape domain; (2) organization of linkages among ecosystem process and structure; (3) processes linking ecosystem elements; (4) change/action scenario submodels predicting responses to restoration actions; and (5) timeframe and variability across multiple temporal scales. We provide an operational example of the model’s structure using a nearshore restoration case study.